A New Book of Arithmetick:

Containing Titles, Tables, Definitions, and Notes, of the most necessary Rules of that Art. Being curiously

Adorned with variety of Penmanship and

COMMAND OF HAND.

In the most free and natural manner by

William Kippax Writing Master and Accomptant.

With whom Youth are Boarded, and Instructed in the various branches of Education: In Great Russel-Street, near Bloomsbury Square, London.

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Numeration,

Numeration teacheth to Value or Expreſs any Number wrritten in Figures.

The Table.

C.s of Millions	X.s of Millions	Millions.	C.s of Thousands.	X.s of Thousands.	Thousands.	Hundreds.	Tens.	Units.
						4	5	2
						6	0	3
					5	4	7	8
				2	0	6	9	7
			1	0	4	0	2	5
		6		5	7	2	3	0	1
	3	9.		0	4	3	6	2	5
1	0	7		6	7	5	0	2	8

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Addition

Addition teacheth to Add or Collect several Numbers together into one whole or total Sum.

Pounds.	Yards.	Gallons.
1254	2017	3569
3907	5123	1271
3124	4769	1451
8735	1234	2342
1923	5450	6904
1546	3245	5121
2109	1356	1456
1754	2145	2351
Total		
Proof		

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Addition of Money

Note that 4 Farthings. make 1 Penny: 12 Pence. 1 Shilling:
and 20 Shillings. 1 Pound.

And the figures placd under £. are always Pounds: those
under S. are Shillings. and those under D are Pence.
Also 1 Farthing is written ¼. 2 Farthings ½. 3 Farthings ¾.

Pence Table			£	S	D	£	S	D
D	s	d						
20 are	1	8	142	16	8½	201	15	7¼
30	2	6	356	9	10	563	16	5½
40	3	4	91	15	7¼	124	18	10
50	4	2	134	-	6	175	16	4¾
60	5	-	642	17	5¾	261	5	7
70	5	10	16	9	11	95	11	-
80	6	8	179	12	6½	67	7	5¼
90	7	6	301	4	-	125	-	6
100	8	4	9	5	7¼	96	-	-
110	9	2						
120	10	-						

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Subtraction.

Subtraction teacheth to take a Lesser Number from a greater and discovers the Remainder or difference.

	Pounds.	Yards.	Gallons.
From	7865	75675	57045
Take	3576	36564	45917
Remains			
Proof			

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	£	S	D	£	S	D
Lent	546	11	5 ¼	615	5	7
Received	365	6	7 ½	317	11	10 ½
Remains						
Proof						
Borrowed	710	–	–	271	–	4 ½
Paid	376	16	8 ¼	190	7	4 ¾
Rests due						
Proof						
Lent	854	15	6	517	–	–
Received at	75	16	7 ½	275	11	–
	127	7	–	156	16	10 ¼
Several times	9	–	6 ¾	76	15	9 ½
	297	15	9	90	16	11 ¾
Received in all	409	19	11 ¼			
Remains	444	15	6 ¾			
Proof	854	15	6			

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Multiplication Table

3 Times 3 is 9
4 .. 12
5 .. 15
6 .. 18
7 .. 21
8 .. 24
9 .. 27
10 .. 30
11 .. 33
12 .. 36

4 Times 4 is 16
5 .. 20
6 .. 24
7 .. 28
8 .. 32
9 .. 36
10 .. 40
11 .. 44
12 .. 48

5 Times 5 is 25
6 .. 30
7 .. 35
8 .. 40
9 .. 45
10 .. 50
11 .. 55
12 .. 60

6 Times 6 is 36
7 .. 42
8 .. 48
9 .. 54
10 .. 60
11 .. 66
12 .. 72

7 Times 7 is 49
8 .. 56
9 .. 63
10 .. 70
11 .. 77
12 .. 84

8 Times 8 is 64
9 .. 72
10 .. 80
11 .. 88
12 .. 96

9 Times 9 is 81
10 .. 90
11 .. 99
12 .. 108

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Multiplication.

Multiplication teacheth to repeat or take any Number proposed which is called the Multiplicand as many times as there are units in another Number called the Multiplier, And to find the Sum, which is here called the Product.

Multiplicands	4576783	6751656
Multipliers	2	70
Products.		120

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Division.

Division teacheth to find how many times a leſs Number, which is called the Divisor, may be had in a greater, called the Dividend. That number which expreſses how often it is contain'd, is called the Quotient; and the over-plus, the Remainder.

Divisor 4) Dividend 1545798 (Rem.r 6) 715675 (

Quotient

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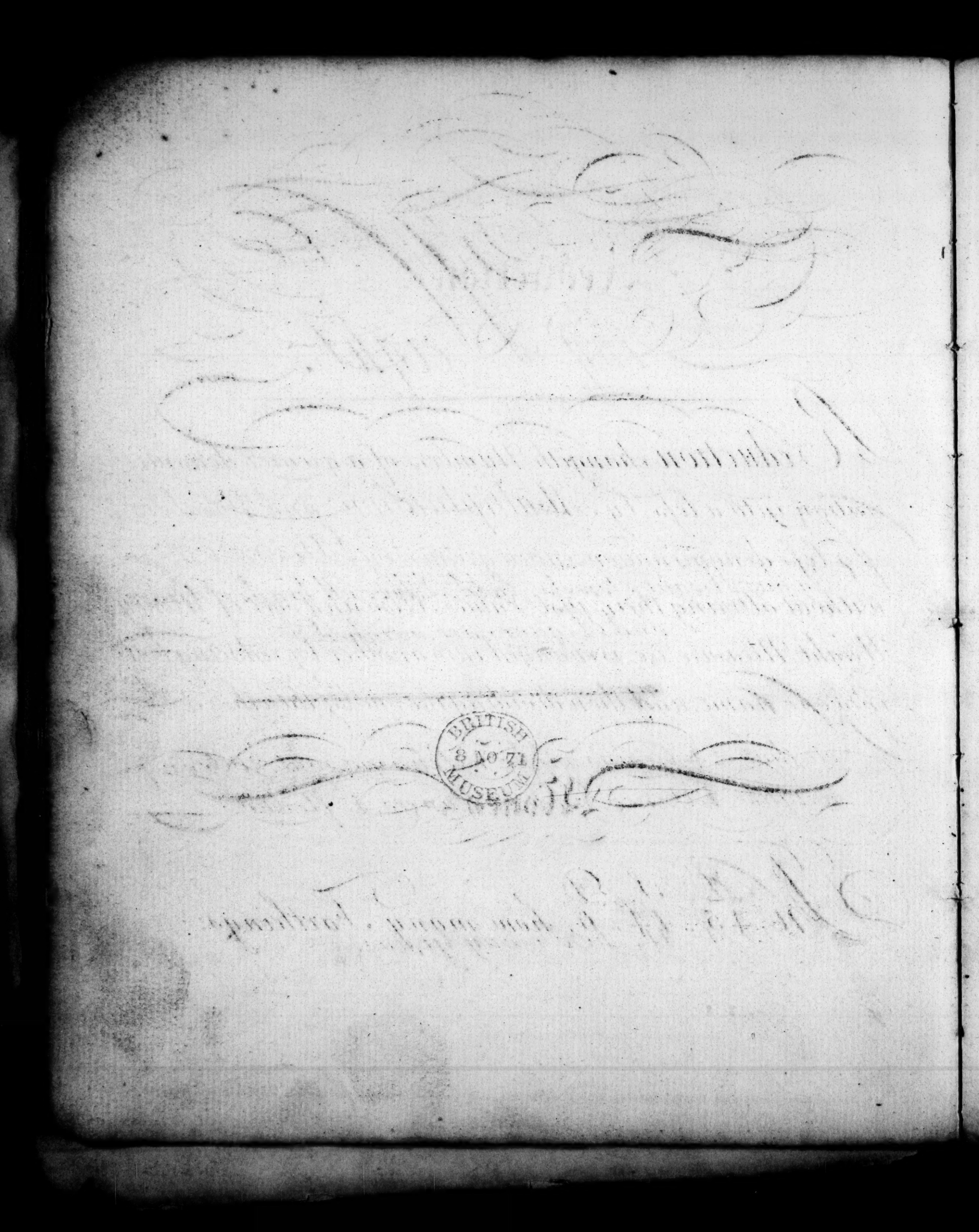
Reduction

Reduction changeth Numbers of a greater denomination into a less, by Multiplication; and Numbers of a less denomination into a greater by Division; without altering their just Values. Also any sort of Money, Weight, Measure &c. is changed into another by reducing both into one name, and then dividing the one by the other.

Money.

In £. *S. D.*
45 .. 14 .. 6. *how many Farthings.*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Troy Weight.

By this Weight, Jewels, Gold, Silver, all kinds of Grain and Liquors are weighed.

Note that, 24 Grains, make 1 Pennyweight: 20 Pennyweights, 1 Ounce; and 12 Ounces, 1 Pound.

Ex. tt: oz: dwts
15 .. 1 .. 11, how many Grains.

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Avoirdupoise Weight.

By this Weight are weighed all large and coarse commodities, as Grocery-wares, Metals, Bread, Flesh, Butter, Cheese, Tallow, Hemp, Drugs &c.

Note that 3 Scruples make 1 Drachm, 8 Drachms 1 Ounce; 16 Ounces 1 Pound; 28 Pounds, 1 Quarter; 4 Quarters, or 112 Pounds, 1 Hundred-weight; 20 C weight, 1 Ton; and 19½ C weight 1 Fodder of Lead.

In C 12. qrs. 2. 15 of Sugar how many Pounds?

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Liquid Measures.

By one or other of the two following Notes all liquid quantities are computed.

Wine Measure.

Note that 8 Pints. make 1 Gallon: 18 Gallons. 1 Rundlet: 31 ½ Gallons. 1 Barrel: 42 Gallons. 1 Tierce: 63 Gallons. 1 Hogshead: 84 Gallons. 1 Puncheon: 2 Hogsheads. 1 Pipe: or Butt: and 2 Pipes or Butts. 1 Tun.

Ale and Beer Measure.

Note that 2 Pints. make 1 Quart: 4 Quarts. 1 Gallon: 8 Gallons. 1 Firkin of Ale, Soap, and Herrings: 9 Gallons. 1 Firkin of Beer: 2 Firkins. 1 Kilderkin: 2 Kilderkins. 1 Barrel; and 2 Barrels. 1 Hogshead.

In 15 Hogsheads of Wine how many Gallons.

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Dry Measure

By this Measure, Corn, Salt, Coals, Lead-Ore, Oisters, Muscles and other dry Goods are measured.

Note that 2 Pints, make 1 Quart: 2 Quarts, 1 Pottle: 2 Pottles. 1 Gallon: 2 Gallons. 1 Peck: 4 Pecks. 1 Bushel Land measure: 5 Pecks, 1 Bushel Water measure: 2 Bushels. 1 Strike: 2 Strikes. 1 Coom or Carnock: 2 Cooms. 1 Seam. or Quarter; 6 Quarters. 1 Wey; $1\frac{2}{3}$ Wey. 1 Last. and 36 Bushels. 1 Chaldron of Coals.

In 18 Quarters of Corn how many Gallons?

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Long Measure.

By this measure, the distance of places, and the length, breadth, or thickness of any thing as land, cloth, wood, stone &c. is measured.

Note that 3 Barly corns, make 1 Inch; 2½ Inches, 1 Nail; 4 Nails, or 9 Inches, 1 Quarter of a Yard; 12 Inches 1 Foot; 4 Quarters of a Yard, or 3 Feet, 1 Yard; 5 Quarters of a Yard, 1 Ell English; 3 Quarters, 1 Ell Flemish; 5½ Yards, 1 Pole; or Perch; 40 Poles, 1 Furlong; 8 Furlongs, 1 Mile; and 3 Miles, 1 League.

EX. 31 Yards how many Nails?

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Time.

Note that 60 Seconds, make 1 Minute; 60 Minutes, 1 Hour; 24 Hours, 1 Day; 7 Days, 1 Week; 365 Days 6 Hours, 1 Year:

The Year is also divided into 12 Months, three of which make a Quarter, and six half a Year; The Days in each Month are shewn in this Verse, Viz:

Thirty Days hath September,
April, June, and November;
All the rest have thirty one,
But February, which alone
Hath twentyeight, except Leap Year,
And Twenty nine is then its Share.

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THE Golden Rule.

So called on account of its extraordinary use both in Arithmetical Questions and in all parts of the Mathematicks. It is also called.

The Rule of Three

AND

Rule of Proportion.

Because in all questions belonging hereto, there are three numbers given to find a fourth in Proportion. This Rule is either Direct or Inverse. And it is both Single and Double.

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The single Rule of Three

Direct.

In Stating your Questions, make the first and third Number of one name, and the second of the same name with that Number which is required; and if there be divers denominations in it, reduce them to the lowest expressid. Then multiply the second and third together, and divide the product by the first. The Quotient will answer the Question in the same name which your second number was of or reduced to

If 3 Yards cost 17 s 6 d what will 11 Yards cost.

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THE

Single Rule of Three

INVERSE.

To know whether a Question belongs to the Direct or Inverse Rule First State your Question in the same manner as is shewn in the Direct Rule; Then, If the third number be more than the first, and according to the true meaning of the Question requires more than it does; or if it be less, and requires less, the Question is Direct: But if the third number be less, and requires more, or more, and requires less; the Question is Inverse.

The method of Stating any Question and preparing the Numbers is the same as in the Direct Rule; but to find the number required, Multiply the first and second numbers together, and Divide the Product by the third, and the Quotient will be the Answer.

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The Double Rule of Three

In Questions belonging to this Rule there are five Numbers given to find a sixth in Proportion which may always be done by two statings in the single Rule of Three, that are either both Direct, or one Direct and the other Inverse

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Practice

Practice is a short method of casting up, or finding the Value of any Quantity of Goods, or Merchandize.

The Table of Parts

£ s d	d	d
1 " - is 1/20 of a £.	2 is 1/120 of a £	1 is 1/12 of a Shilling
1 " 8 ..... 1/12	3 - - - 1/80	1 1/2 - - - 1/8
2 " - 1/10	4 - - - 1/60	2 - - - 1/6
2 " 6 - - - - 1/8	6 - - - 1/40	3 - - - 1/4
3 " 4 ..... 1/6	8 - - - 1/30	4 - - - 1/3
4 " - - - - 1/5	12 - - - 1/20	6 - - - 1/2
5 " - 1/4		
6 " 8 - - - - 1/3	lb 14 is 1/8 of an C	gall.s 7 is 1/9 of an Hogshead
10 " - - - - 1/2	16 - - - 1/7	9 - - - 1/7

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Tare and Tret

Tare is an Allowance in Merchandize, which the Seller makes to the Buyer for the weight of the Chest, Bag, Cask or whatever else the Goods are put in.

Tret is an allowance for the Waste, Dust, Dirt or Drofs that may be mixt with such Goods as require cleansing and is always 4 Pounds in every 104 Pounds, or $\frac{1}{26}$ part.

There is also another allowance made to the buyer for the turn of the Scale in weighing large Quantities, called Cloffe or Draught, which is 2 Pounds in every 3 C weight.

Note The whole weight from which any of these allowances are to be taken is called Grofs, when part is deducted the Remainder is called Suttle, but when all are taken from it that which remains is called Neat.

Interest

Interest is a sum of money, reckoned for the use or forbearance of another sum called the Principal which is lent for or becomes due at a certain time. The Rate of Interest is so much ℔ Cent. ℔ Ann. that is so much on 100 for 1 Year, as the Law or the agreement of Parties fixes, which at at present is not to exceed 5 ℔ Cent. ℔ Ann.

Interest is either Simple or Compound

Simple Interest is counted and arises from the Principal only

Compound Interest is counted and arises from the Principal and it's Interest put together as it becomes due and is forborn therefore it is also called Interest upon Interest.

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Discount

Discount or Rebate is an allowance or a deduction from any Debt or Bill of Exchange for the payment there of, before it becomes due. And it is equal to the Interest that will arise at any first rate from the Money paid or Present worth of the Debt, till the Debt would have become due.

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Exchange

Exchange is a Rule, that teacheth to find how much money of any known Species, must be given or received for the same value in other Money, of different Species, which may properly be called the trade of Money carried on between one place and another by Bills of Exchange That is by giving money in one City or Country, and receiving a Bill to entitle the giver to receive the same value in another City or Country, and the contrary.

The Par of Exchange signifies equal value, and is certain and fixt in Flemish and Dutch Money it is 33 s. 4 d. for 1 £ Sterling In French Money 1 Crown for 4 s. 6 d. Sterling. But the Course of Exchange varies almost every day from London to other Countries; that is, it rises above, or falls below the Par, according to the Plenty or Scarcity of Money, or according to the time allowed for Payment.

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The most difficult computations in Exchange are those with Holland and Flanders; on account of their different denominations of their Money, their Agio's, &c. Therefore I have given the following Explications.

The Dutch, and Flemish, exchange with some Countries by Florins, Stivers, and Penninks. But with London and several other places, by Pounds, Shillings, and Pence Flemish. And they draw; and accept their Bills in Bank-money; but they keep their Accompts and make their payments in Current-money. Therefore in exchanging with other nations, they reduce their Current into Bank-Money. The difference of which is called Agio; and is Simple Interest on Bank, but Discount of Current Money; which may be found in either, by one of those Rules; And being added to Bank Money makes it Current; and Subtracted from Current Money, makes it Bank. In Holland the Agio usually rises and falls, according to the several occurrences of Trade, betwixt 3, and 5 ℔ Cent. But in Flanders it is fixt at $16\frac{2}{3}$ ℔ Cent. or $\frac{1}{6}$.

Dutch and Flemish Money

Note that, 16 Penninks, make 1 Stiver; 20 Stivers, 1 Florin or Guilder and 6 Florins 1 £. Flemish.

Also; 12 Pence, make 1 Shilling; and 20 Shillings 1 £. Flemish

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